Dec. 31, 1935. S. MORGAN 2,026,054

GAS BURNER

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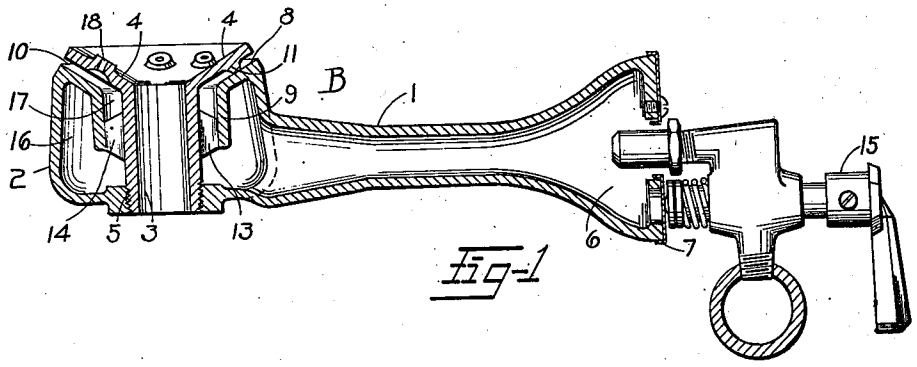


Fig-1

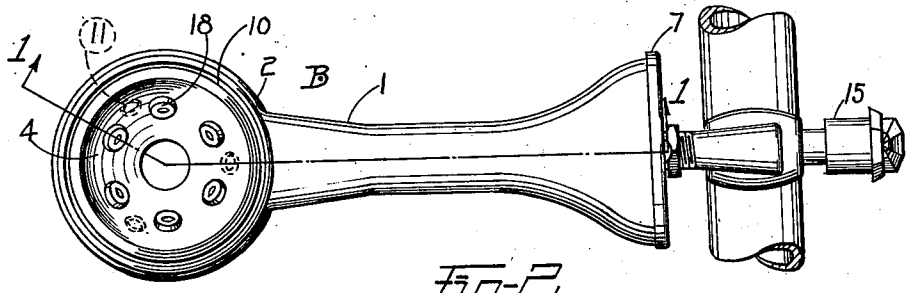


Fig-2

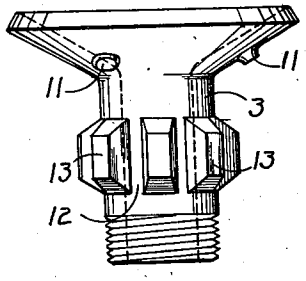


Fig-3

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GAS BURNER

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5 Claims. (Cl. 158—116)

This invention relates to gas burners and more particularly to such burners as are employed with cooking stoves, hot air furnaces and steam and hot water boilers.

The general object of the invention is to provide a burner, the parts of which can be rapidly and accurately machined and easily assembled or disassembled.

Another object is to produce a burner in which the gas and air is subjected to mixing and expansion before reaching the discharge passage.

Another object of the invention is to provide a burner that will operate on any of the gases now commercially used without any change in the burner itself.

The foregoing and other objects and advantages will be understood from the following description considered in connection with the accompanying drawing, in which:

Figure 1 is a longitudinal sectional view of my improved burner;

Figure 2 is a plan view of the burner; and

Figure 3 is a side elevation of the burner head detached.

Referring more particularly to the drawing B denotes the burner as a whole, comprising a mixing tube 1, terminating at its inner end in a bowl shaped portion or outer member 2, in which a burner head or inner member is removably mounted. The burner head consists of a hollow cylindrical portion 3 having an upwardly and outwardly flared annular flange 4 at its upper end. The mixing tube 1 and the lower end of cylindrical portion 3 of the burner head are threadedly connected as at 5.

The top edge or rim of the bowl 2 is formed with a downwardly and inwardly inclined extension 8 and depending from this extension is a hollow cylindrical skirt portion 9. This skirt portion extends parallel with and in spaced relation to the hollow cylindrical portion 3 of the burner head, while the opposing faces of extension 8 and annular flange 4 are also parallel with and spaced from each other. These opposing faces are preferably highly machined to present smooth surfaces to the air and gas mixture flowing through the annular orifice or slot 10, formed there-between. A plurality of projections 11, preferably not more than three in number, formed on the under face of the flange 4, of the burner head limit the extent to which the burner head can be screwed home in the mixing bowl or chamber, and thus determine the width of the slot or port 10. The hollow cylindrical portion 3 of the burner head is provided with a ring shaped raised portion in which vertical slots 12 are cut, thus forming spaced radially extending projections 13, intermediate its lower end and the flange 4. The projections 13 engage the skirt 9, serve as a guide and support to the burner head and together with the wall of the skirt seal the sides of the vertical slots 12.

When the burner head is screwed home the thus formed open ended slots 12 become the primary or measuring ports for the gas flowing through the burner, and at the same time the projections 13 hold the burner head in its central position. It will of course be understood that the radial projections 13 are of a length or depth to just fit within the circular opening or passage 14 through the bowl.

The annular orifice or ring shaped slot 10, which constitutes a circular continuous single secondary port communicating at its inner annular end with a ring-shaped chamber 17, immediately above the vertical slots 12, supports an annular flame when gas is supplied to the burner. Gas is supplied to the mixing tube from a gas cock 15, which discharges the gas in a convenient manner into a primary mixing chamber or head 6 at the outer end of the tube. This chamber is closed by the customary slide damper air control 7, for regulating the flow of air, which is drawn into the chamber, when gas is discharged thereinto. The gas is first mixed with air in the primary chamber 6 and then travels on through the tube 1 into a secondary ring shaped mixing chamber 16, in the bowl 2, inspirating air enroute. The mixture then flows in predetermined quantities through the vertical primary ports or slots 12, which are of the area required to give the proper flow of gas. After leaving the primary measuring ports 12, the mixture enters the ring-shaped chamber 17, the area or capacity of which is much larger than the area or capacity of the primary or measuring ports 12. This large area allows the gas mixture to expand and to equalize the pressure over the measuring ports.

As is customary with burners of this type a number of small inwardly inclined ports 18, extending through the flange 4 of the burner head, and communicating with the single circular port 10, are provided. These ports 18, direct the mixture toward the center of a cooking vessel, not shown, and preclude the possibility of a central relatively cold spot.

The mixture flows from the ring-shaped chamber 17 into the single circular secondary port or

slot 10, and thence through this slot and through the individual inwardly inclined ports 18 to the air, where it is burned. Since the mixture must pass through the primary or measuring ports 12, which are fixed in size, on its way to the secondary ports 10 and 18, it follows that the burner head could be moved upwardly, that is partly unscrewed without materially affecting the amount of gas flowing through the secondary ports. Therefore, it is possible to adjust the width of the slot 10, permanently by means of the projections 11, so that the burner would burn many of the gases now in commercial use by merely changing the size of the orifice in the outlet of the gas cock 15, and readjusting the air shutter 7.

While I have described and shown but one embodiment of my invention, I do not wish to limit myself to the exact description, as it is evident that modifications are possible without deparing from the spirit of the invenion.

Having thus described my invention:

What I claim is:

1. In a burner for gaseous fuels, a burner head comprising a ring shaped mixing chamber, a second smaller, ring-shaped mixing chamber above said first chamber, vertical passages of predetermined cross section connecting said first mixing chamber with said second chamber and a circumferential outlet slot of predetermined width circumferentially connecting said second chamber with the open atmosphere.

2. In a burner for gaseous fuels, a burner head comprising a ring shaped mixing chamber, a second, smaller, ring shaped mixing chamber arranged above said first mixing chamber in axial alignment therewith, vertical passages of predetermined cross section connecting said first mixing chamber with said second mixing chamber and a circumferential outlet slot of predetermined width circumferentially connecting said second mixing chamber with the open atmosphere.

3. In a burner for gaseous fuels, a burner head comprising a ring shaped mixing chamber, a second, smaller, ring shaped mixing chamber arranged above said first mixing chamber, a plurality of vertical passages of predetermined cross section connecting said first mixing chamber with said second mixing chamber, a circumferential outlet slot circumferentially connecting said second mixing chamber with the open atmosphere and means for limiting the width of said slot, the combined cross sections of the said vertical passages being smaller than the cross section of said second mixing chamber.

4. A burner for gaseous fuels comprising a primary mixing chamber, a secondary mixing chamber connected with said first chamber, a ring shaped mixing chamber of less cross section than said secondary mixing chamber arranged above said last chamber in axial alignment therewith, a plurality of symmetrically arranged vertical passages of predetermined cross section connecting said secondary mixing chamber with said ring-shaped mixing chamber, and a circumferential outlet slot of predetermined width circumferentially connecting said ring-shaped mixing chamber with the open atmosphere.

5. In a burner for gaseous fuels, a burner head comprising a bowl-shaped portion having an integral skirt portion arranged in substantially parallel relation with respect to the inner wall thereof to form a ring shaped chamber open at its lower end, a hollow cylindrical member including a cone shaped top portion threadedly connected with said bowl shaped portion in spaced relation with respect to said skirt portion, and relatively short guiding projections on said cylindrical portion contacting with said skirt adjacent to the bottom portion thereof and forming a plurality of vertical passages of limited cross sectional area, the top portion of said bowl shaped portion being cone-shaped and the top portion of said cylindrical member being arranged parallel to the top portion of said bowl-shaped portion in slightly spaced relation for forming a circumferential outlet passage at the upper end of said burner head.

SWINEY MORGAN.